What is claimed is:

1. A method for inspecting a surface of a sheet of material comprising:

(a) providing a plurality of optical fibers, each fiber having a cleaved end, said cleaved ends being arranged in an array which has a longitudinal axis;

(b) positioning said array with respect to said surface so that each optical fiber is associated with a region of the surface;

(c) for each optical fiber, introducing coherent light into the fiber to produce reference and measurement beams which optically interfere with each other, said reference beam comprising light that has been reflected by the cleaved end without passing out of the fiber and said measurement beam comprising light that has passed out of the fiber through the cleaved end, has reflected from the region of the surface associated with the fiber, and has reentered the fiber through the cleaved end; and

(d) for each optical fiber, detecting the intensity of the interfering reference and measurement beams, said intensity being a measure of the distance between the cleaved end and the region of the surface associated with the fiber.

2. The method of Claim 1 wherein for each optical fiber, less than 10 percent of the light that passes out of the fiber through the cleaved end in step (c) reflects from the region of the surface associated with the fiber.

3. The method of Claim 1 wherein for each optical fiber, less than 5 percent of the light that passes out of the fiber through the cleaved end in step (c) reflects from the region of the surface associated with the fiber.

4. The method of Claim 1 wherein the cleaved ends are arranged in a single row.

5. The method of Claim 1 wherein the cleaved ends are arranged in at least two rows with the fibers in one of the rows being staggered relative to the fibers in another of the rows.

6. The method of Claim 1 wherein:

(i) each of the optical fibers comprises a core and a cladding; and

(ii) the claddings of at least some of the optical fibers are in contact at the cleaved ends and/or adjacent thereto.

7. The method of Claim 6 wherein the claddings of at least some of the fibers are tapered.

8. The method of Claim 1 wherein:

(i) in step (a), the optical fibers are polarization-maintaining fibers;

(ii) in step (c), the coherent light is unpolarized light; and

(iii) step (d) comprises the steps of:

(1) splitting the interfering reference and measurement beams into two orthogonal components based on polarization; and

(2) individually detecting the intensity of one of the components.

9. The method of Claim 1 including the additional steps of repositioning the array and repeating steps (c) and (d).

10. The method of Claim 9 wherein the repositioning comprises moving the array in a direction perpendicular to the longitudinal axis.

11. The method of Claim 9 wherein the repositioning comprises moving the array in a direction parallel to the longitudinal axis.

12. The method of Claim 1 wherein step (b) comprises using the detected intensity for the interfering reference and measurement beams for at least one of the fibers as a feedback variable for positioning the array adjacent to the surface.

13. The method of Claim 1 wherein the sheet of material is a sheet of glass.

14. A method for inspecting a surface of a sheet of material comprising:

(a) providing a plurality of polarization-maintaining optical fibers, each fiber having a cleaved end, said cleaved ends being arranged in an array which has a longitudinal axis;

(b) positioning said array with respect to said surface so that each optical fiber is associated with a region of the surface;

(c) for each optical fiber, introducing unpolarized coherent light into the fiber to produce reference and measurement beams which optically interfere with each other, said reference beam comprising light that has been reflected by the cleaved end without passing out of the fiber and said measurement beam comprising light that has passed out of the fiber through the cleaved end, has reflected from the region of the surface associated with the fiber, and has reentered the fiber through the cleaved end; and

(d) for at least one of the optical fibers:

(i) splitting the interfering reference and measurement beams into two orthogonal components based on polarization;

(ii) individually detecting the intensities of said components; and

(iii) comparing said individually detected intensities to determine a property of the region of the surface associated with the fiber.

15. The method of Claim 14 wherein for each optical fiber, less than 5 percent of the light that passes out of the fiber through the cleaved end in step (c) reflects from the region of the surface associated with the fiber.

16. The method of Claim 14 wherein the property is selected from the group consisting of the presence of a defect with a high aspect ratio, the presence of a defect which comprises a change in the chemical composition of the surface, and combinations thereof.

17. The method of Claim 16 wherein the defect with a high aspect ratio is a scratch, a bubble, or a combination thereof.

18. The method of Claim 16 wherein the defect which comprises a change in the chemical composition of the surface is a stain, a platinum protrusion, a bubble, or a combination thereof.

19. The method of Claim 14 wherein the sheet of material is a sheet of glass.

20. A method for inspecting a region of a surface of a sheet of material comprising:

(a) providing a polarization-maintaining optical fiber having a cleaved end;

(b) positioning the cleaved end adjacent to the region of the surface;

(c) introducing unpolarized coherent light into the fiber to produce reference and measurement beams which optically interfere with each other, said reference beam comprising light that has been reflected by the cleaved end without passing out of the fiber and said measurement beam comprising light that has passed out of the fiber through the cleaved end, has reflected from the region of the surface, and has reentered the fiber through the cleaved end;

(d) splitting the interfering reference and measurement beams into two orthogonal components based on polarization; and

(e) individually detecting the intensities of said components;

wherein the relative magnitudes of said individually detected intensities is indicative of a characteristic of the region of the surface which reflected the measurement beam.

21. The method of Claim 20 wherein less than 5 percent of the light that passes out of the fiber through the cleaved end in step (c) reflects from the region of the surface.

22. The method of Claim 20 wherein the characteristic is selected from the group consisting of the presence of a defect with a high aspect ratio, the presence of a defect which comprises a change in the chemical composition of the surface, and combinations thereof.

23. The method of Claim 22 wherein the defect with a high aspect ratio is a scratch, a bubble, or a combination thereof.

24. The method of Claim 22 wherein the defect which comprises a change in the chemical composition of the surface is a stain, a platinum protrusion, a bubble, or a combination thereof.

25. The method of Claim 20 wherein the sheet of material is a sheet of glass.